

Notice of Allowability

Application No.

10/056,842

Examiner

Brad Y. Chin

Applicant(s)

COOPER ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/23/2005.
2. ☒ The allowed claim(s) is/are 1-26 and 36-41.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the claims:

In claim 1, line 3, remove the conjunction, "and", following the word, "therein".

In claim 15, line 4, remove the conjunction, "and", following the word, "therein".

In claim 21, line 4, remove the conjunction, "and", following the word, "therein".

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

2. Claims 1-26 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Applicant's claims, 1-26, include the limitations for an apparatus for treating pollutants in a gas, where the apparatus comprises a gas flow tube carrying a flow of gas and comprising a sidewall having a opening therein; a source of hydrogen peroxide; and a treatment injector connected to the opening in the sidewall of the gas flow tube. The treatment injector comprises an injector housing having an inlet, outlet, and a hollow interior extending therebetween. The inlet of the injector housing is connected in fluid communication with the source of hydrogen peroxide so that the hydrogen peroxide flows through the hollow interior toward the outlet, where a UV lamp

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is positioned within the hollow interior of the injector housing for dissociating hydrogen peroxide and injecting the dissociated hydrogen peroxide into the flow of gas for treating pollutants.

DeLoach [U.S. Patent No. 5,256,379] teaches an apparatus and method for removing pollutants in a contaminated flowstream in the presence of an atomized reagent, such as hydrogen peroxide, where the contaminated flowstream and hydrogen peroxide mixture is further treated with ultraviolet light. DeLoach fails to teach that the hydrogen peroxide is reacted with the ultraviolet light in an apparatus prior to being injected into the contaminated airstream.

Takahashi [U.S. Patent No. 4,344,918] discloses an apparatus and method that uses the reaction between hydrogen peroxide, which is fed into a reactor containing a contaminated liquid, and ultraviolet radiation, which is produced by a mercury vapor lamp immersed in the reactor, to create the hydroxyl free radical, -OH. Takahashi fails to teach the injector housing where the hydrogen peroxide is fed into the inlet to react with the ultraviolet radiation, producing the hydroxyl free radical, -OH, which is then forced out the outlet of the injector housing and into the gas flow tube. None of the references teach the claimed limitations nor would it have been obvious to combine references to achieve the claimed inventive subject matter.

3. Claims 36-41 are allowed.

The following is an examiner's statement of reasons for allowance: Claims 36-41 include the limitations for a method for treating pollutants in a flow of gas carried by a gas flow tube using a hydrogen peroxide source, where the method comprises: coupling a treatment injector between the hydrogen peroxide source and the gas flow tube, the treatment injector comprising an inlet, an outlet, and a hollow interior extending therebetween, the inlet being connected in fluid communication with the source of hydrogen peroxide, the treatment injector further comprising at least one ultraviolet (UV) lamp positioned within the hollow interior of the injector

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housing; and flowing hydrogen peroxide through the hollow interior of the injector housing and toward the outlet while operating the at least one UV lamp to dissociate hydrogen peroxide so that dissociated hydrogen peroxide is injected into the flow of gas from the outlet for treating pollutants in the flow of gas.

As identified above in paragraph 6, DeLoach teaches an apparatus and method for removing pollutants in a contaminated flowstream in the presence of an atomized reagent, such as hydrogen peroxide, where the contaminated flowstream and hydrogen peroxide mixture is further treated with ultraviolet light. However, DeLoach's method fails to teach that the treatment injector is coupled between the source of hydrogen peroxide and the gas flow tube and provides for a flow of hydrogen peroxide through the hollow interior of the injector housing and toward the outlet while operating the at least one UV lamp to dissociate hydrogen peroxide for treating pollutants in the flow of gas. Takahashi teaches an apparatus and method that uses the reaction between hydrogen peroxide, which is fed into a reactor containing a contaminated liquid, and ultraviolet radiation, which is produced by a mercury vapor lamp immersed in the reactor, to create the hydroxyl free radical, $\cdot\text{OH}$. However, Takahashi fails to teach Applicant's method of coupling the injector housing between the source of hydrogen peroxide and the gas flow tube and of flowing hydrogen peroxide through the hollow interior to dissociate hydrogen peroxide prior and injecting such dissociated hydrogen peroxide into the gas flow tube to treat pollutants in the flow of gas.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brad Y. Chin whose telephone number is 571-272-2071. The examiner can normally be reached on Monday – Friday, 8:00 A.M. – 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sun (John) Kim, can be reached at 571-272-1142. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

byc
July 6, 2005


JOHN KIM
SUPERVISORY PATENT EXAMINER